

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF THE CLAIMS

1. (Currently Amended) A vapor decontamination system for decontaminating a defined region, the system comprising:

at least a first duct ~~along~~ through which a first carrier gas flow passes to the defined region;

5 a flash vaporizer for vaporizing a liquid which includes an antimicrobial compound into vapor;

a second carrier gas flow connected with the flash vaporizer, an outlet of the flash vaporizer being connected to the duct for supplying the second carrier gas flow and vapor into the duct for absorption into the first carrier gas flow passing
10 through the duct at a mixing zone downstream of the flash vaporizer; and

a means for introducing the liquid from a source to the flash vaporizer.

2. (Original) The system as set forth in claim 1 wherein the antimicrobial compound includes hydrogen peroxide and the flash vaporizer includes:

a metal block;

at least one heater for heating and maintaining the metal block at or
5 above a vaporization temperature of hydrogen peroxide and below a hydrogen peroxide disassociation temperature; and

a passage extending through the block from an inlet to the outlet.

3. (Original) The system as set forth in claim 2 wherein the passage expands in cross section between the inlet and the outlet.

4. (Original) The system as set forth in claim 3, wherein the passage turns at least 180° between the inlet and the outlet.

5. (Original) The system as set forth in claim 4 wherein the passage includes at least two turns of approximately 90° and a wall therebetween, such that the liquid in the passage strikes the wall, thereby increasing a vaporization rate of the liquid antimicrobial compound.

6. (Original) The system as set forth in claim 4 wherein the passage includes:

a plurality of interconnected bores extending back and forth through the block between the inlet and the outlet.

7. (Previously Presented) The system as set forth in claim 12 further including:

a microbe trapping filter between the duct and the defined region.

8. (Previously Presented) The system as set forth in claim 1 further including:

a heater and a dehumidifier connected with the duct upstream from the mixing zone.

9. (Previously Presented) The system as set forth in claim 8 wherein the duct includes:

an inlet upstream of the heater and the dehumidifier connected with the defined region such that the first carrier gas flow is circulated from the duct inlet, through the heater and dehumidifier, through the mixing zone, and through a duct outlet into the defined region.

10. (Original) The system as set forth in claim 9 further including:

microbe trapping filters disposed adjacent the duct inlet and the duct outlet.

11. (Previously Presented) The system as set forth in claim 9 wherein the antimicrobial compound includes hydrogen peroxide and further including:

5 a hydrogen peroxide destroyer for decomposing hydrogen peroxide vapor into water vapor and oxygen, the destroyer being disposed upstream from the dehumidifier.

12. (Currently Amended) A decontamination system for decontaminating a defined region, the system comprising:

at least a first duct ~~along~~ through which a first carrier gas flow is passed to the defined region;

5 a heated block and fluid passage for dispersing a liquid which includes an antimicrobial compound in a second carrier gas flow, the heated block having an inlet and an outlet, the outlet of the block being connected to the duct for supplying the second carrier gas flow with the dispersed liquid to a mixing zone in the duct for absorption into the first carrier gas flow passing through the duct; and

10 a source of the carrier gas flow connected with the block inlet for creating a positive pressure differential from the heated block to the mixing zone.

13. (Original) The system as set forth in claim 1 further including:

at least one additional flash vaporizer and means for introducing liquid connected with the duct.

14. (Original) The system as set forth in claim 1 further including:

at least a second duct; and,

5 at least a second flash vaporizer and means for introducing liquid connected with the second duct.

15. (Previously Presented) The system as set forth in claim 1 further including:

a first plurality of monitors connected with the duct upstream of the mixing zone;

5 a second plurality of monitors disposed in the defined region; and

a controller connected to the monitors for controlling the means for introducing liquid in accordance with monitored conditions in the duct and in the defined region.

16. (Previously Presented) The system as set forth in claim 12 further including:

fans disposed in the defined region for circulating vapor into partially occluded subregions.

17. (Previously Presented) The system as set forth in claim 12 wherein the means for introducing the liquid further including a metering pump which meters the liquid into the passage of the block.

18. (Currently Amended) A method of decontaminating a defined ~~area~~ region, the method comprising:

pumping a first carrier gas stream through a duct to the defined region;

5 in a passage different from the duct, converting a liquid into an antimicrobial dispersion in a second carrier gas stream; and

injecting the formed antimicrobial dispersion into the second carrier gas stream at a mixing zone defined in the duct upstream of the defined region to entrain the antimicrobial dispersion in the carrier gas.

19. (Previously Presented) The method as set forth in claim 18 wherein a carrier gas flow through the duct is at a rate of at least 20 cubic meters per minute and the defined region is an enclosure of at least 10,000 cubic meters.

20. (Previously Presented) The method as set forth in claim 18 wherein the antimicrobial dispersion includes vapor phase hydrogen peroxide and further including:

5 heating a block which has an internal passage to a temperature sufficient to vaporize the hydrogen peroxide but which temperature is lower than a temperature which disassociates hydrogen peroxide;

passing hydrogen peroxide into the passage through the block to vaporize the hydrogen peroxide;

10 passing the hydrogen peroxide vapor from the passage into the mixing zone; and

mixing the hydrogen peroxide vapor into the carrier gas flow.

21. (Currently Amended) ~~The A method of decontaminating a defined region, the method comprising as set forth in claim 20 further including:~~

5 pumping a first carrier gas through a duct to the defined region;
in a passage different from the duct, converting a liquid into an antimicrobial dispersion which includes hydrogen peroxide;

blowing a second carrier gas through the passage with the hydrogen peroxide to create a positive pressure differential between the passage and the duct; and

10 passing the antimicrobial dispersion from the passage into a mixing zone defined in the duct upstream of the defined region to entrain the antimicrobial dispersion in the first carrier gas.

22. (Original) The method as set forth in claim 20 further including heating and drying the carrier gas in the duct upstream of the mixing zone.

23. (Previously Presented) The method as set forth in claim 18 further including:

pulling carrier gas with antimicrobial dispersion from the enclosed area through a microbe-trapping filter; and

5 drying and heating the carrier gas and passing the dried, heated carrier gas to the duct upstream of the mixing zone.

24. (Currently Amended) The method as set forth in claim 23 further including anti-microbially filtering carrier gas between the duct and the defined area region.

25. (Original) The method as set forth in claim 18 wherein the defined region is a large room and the duct includes existing HVAC duct work.

26. (Previously Presented) The method as set forth in claim 25 further including:

supplying carrier gas through a plurality of ducts into the room; and
injecting hydrogen peroxide dispersion into the carrier gas in each of
5 the ducts.

27. (Previously Presented) The method as set forth in claim 18 further including:

directing antimicrobial dispersion in the defined region against at least one surface to be decontaminated.

28. (Previously Presented) The method as set forth in claim 18 further including:

monitoring concentration of the antimicrobial compound in the dispersion in the room and carrier gas conditions in the duct upstream of the mixing
5 zone, and

controlling a rate at which the antimicrobial dispersion is supplied to the duct in accordance therewith.

29. (Previously Presented) The method as set forth in claim 18 further including:

monitoring a concentration of the antimicrobial compound in the dispersion in the defined region until the concentration reaches a preselected level;
5 and

holding the dispersion in the defined region without further addition of antimicrobial dispersion for a period of time.

30. (Previously Presented) The method as set forth in claim 18 further including:

heating a block above a vaporization temperature of a peroxy compound; and

5 metering the peroxy compound in liquid form into an internal bore in the block to vaporize the peroxy compound.

31. (Previously Presented) The method as set forth in claim 18 further including:

entraining a liquid peroxy compound into a controlled air flow in the passage.

32. (Previously Presented) The method as set forth in claim 31 wherein the passage turns and further including:

propelling peroxy compound droplets into heated passage surfaces at turns in the passage.

33. (Previously Presented) A method of decontaminating an enclosure comprising:

providing a first carrier gas stream and a second carrier gas stream, the first stream having a lower flow rate than the second stream;

5 introducing the first stream to a passage, the passage having at least one bend;

introducing a flow of an aqueous solution of a peroxy compound into the passage upstream of the bend, the peroxy compound mixing with the first stream, walls of the passage being heated to vaporize the aqueous solution; and

- 10 mixing the vaporized aqueous solution and first carrier gas stream with the second carrier gas stream in a mixing zone downstream of the passage and transporting the mixed vaporized aqueous solution and first and second carrier gas streams to the enclosure.